

THE ULTIMATE RESULTS IN A CASE OF EX-
SECTION OF THE HEAD AND UPPER THIRD
OF THE HUMERUS.

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AT the battle of Williamsburg, May 5, 1862, the patient, Watkins, was wounded by a rifle ball, sustaining a compound comminuted fracture of the upper third of the humerus. Ten days after the infliction of the injury he was operated upon at the Mill Creek Hospital, by Dr. Leroy McLean, then surgeon of the Second New York Volunteers, now of Troy, N. Y. The following information concerning the case, for which we are indebted to the Surgeon General, U. S. Army, is contained in the records of his office.

Head and continuity of humerus to the extent of five inches were excised by linear incision six and one-half inches between deltoid and biceps. Some atrophy. Apparatus, applied two years and nine months afterwards, was very successful in sustaining rigidity of arm.

For some years subsequently at infrequent intervals the track of the wound suppurated and discharged small pieces of necrosed bone—a condition of affairs doubtless favored by the patient's intemperate habits and irregular life. He was admitted to the Eastern Michigan Asylum April, 1887, suffering from mental enfeeblement consequent upon repeated attacks of hemiplegia affecting the left side.

The present state of the arm, and the free use which he has

of it are highly complimentary to the success of the operation. Considering the extent of the bone excised, the wide latitude of voluntary motion preserved to the arm is quite remarkable. Without the assistance of any apparatus to give the arm support, he can feed himself, button his clothing, and perform many acts which require complexity of movement. He

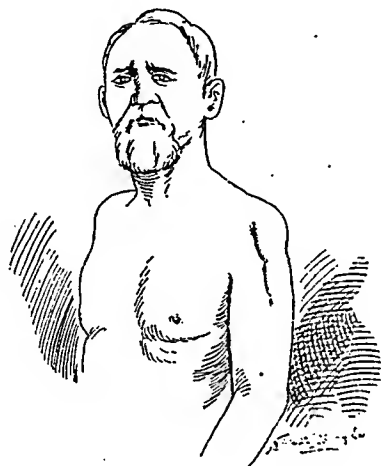


FIG. 1. APPEARANCE OF ARM TWENTY-FIVE YEARS AFTER EXSECTION OF HEAD AND UPPER THIRD OF HUMERUS.

is able also to make strong traction with arm extended—sufficient at least to carry a pail of water suspended from the hand. The hand-grasp is strong, and the arm below the line of incision does not differ perceptibly from its fellow in size.

The motions of the arm seem to be limited to two—a vertical motion towards the scapula, and a slight backward motion. The patient can not bring the humerus forward upon the chest. It is probable that only the lower portion of the humeral at-

tachment of the pectoralis major remains; and as this portion is made up of the fibres coming from the sternal half of the clavicle, it follows that any action of the fibres of the muscle which remain attached to the bone will be to raise the arm vertically toward the scapula, at the same time drawing it closer to the subject's side. Consequently the pectoralis

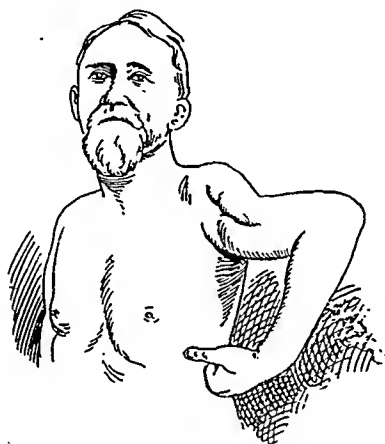


FIG. 2 AMOUNT OF ELEVATION TWENTY-FIVE YEARS AFTER OPERATION.

major is limited in its action in this case to assisting the deltoid and coraco-brachialis.

There is marked atrophy of the deltoid, but inasmuch as its insertion is preserved entire, the muscle is able by contracting to raise the humerus towards the scapula. It cannot however act so as to extend the arm at right angles to the body, owing to the lack of any fixed point. In other words, the fulcrum to the lever is wanting.

The subscapularis, infraspinatus and teres minor—muscles concerned principally in performing rotation of the arm—hav-

ing lost their insertion, have become greatly atrophied from disuse.

The slight backward motion which the patient is able to give to the upper portion of the arm is probably derived from the action of the *teres major*, some fibres of which are probably still inserted into the humerus. It does not seem likely that the *latissimus dorsi*, the principal agent for this motion in the normal arm, is able to effect any here, as its point of insertion is higher than that of the *teres major*, and in this case it seems lacking.

The *coraco-brachialis*, which would ordinarily assist the deltoid in raising the humerus toward the scapula, probably plays very little part here. It, together with the short head of the biceps, lies near the track of the wound and seems to be much atrophied. By means of the deltoid and the remaining fibres of the *pectoralis major* the patient is able to bring the humerus close up against his body, and by thus establishing a fixed point for it, assists in performing the various motions of the fore-arm and hand which are concerned in feeding himself, fastening his clothing, and similar acts.